

**Nicki:** Welcome to the Healthy Rebellion Radio. This is an episode of Salty Talk, a deep dive into popular and relevant health and performance news pieces mixed with the occasional salty conversation with movers and shakers in the world of research, performance, health, and longevity. Healthy Rebellion Radio's Salty Talk episodes are brought to you by Drink LMNT, the only electrolyte drink mix that's salty enough to make a difference in how you look, feel, and perform. We co-founded this company to fill a void in the hydration space. We needed an electrolyte drink that actually met the sodium needs of active people, low carb, keto, and carnivore adherence, without any of the sugar, colors, and fillers found in popular commercial products. Health rebels, this is Salty Talk.

**Nicki:** And now, the thing our attorney advises. The contents of this show are for entertainment and educational purposes only. Nothing in this podcast should be considered medical advice. Please consult your licensed and credentialed functional medicine practitioner before embarking on any health, dietary, or fitness change. And given that this is Salty Talk, we should expect the occasional expletive.

**Robb:** Welcome back, everybody. Another edition of the Healthy Rebellion Radio.

**Nicki:** This is a Salty Talk this time. We've got one of our always fan faves today, Chris Kresser. Everybody knows Chris at this point. At least, I think everybody should know Chris at this point. He's been in this ancestral health space for a long time.

**Robb:** Since the beginning.

**Nicki:** Since the beginning, yes, since day one.

**Robb:** So Chris and I jumped in. It-

**Nicki:** Actually, before you go into your overview, I just want to give a couple of updates, because we are starting our fall Rebel Reset here. Actually, the kickoff call is today, the day this episode releases, Friday, September 9th. Robb and I will be doing the kickoff call, and that is followed by our seven-day carb test, which will officially start on Monday the 12th. So the kickoff call is the overview of everything to expect in the reset. The seven-day carb test is a week long. It's optional. Lots of people do it, lots of people choose not to do it, and we go over the reasons, pros and cons for doing it. If you've read *Wired to Eat*, you'll understand some of the background info on that. And then, the actual 30-day reset itself will begin on Monday, September 19th.

**Nicki:** And it's just an awesome time to get clear on some goals and make some really positive behavior change and new habits with a solid community of people who... Many have changed their lives in significant ways over the years. We're always still a work in progress and trying to dial in new things, whether it's trying to eliminate a new food to see if it has an effect on something we might have going on physically, or maybe we're trying to dial in our sleep a little bit better to increase performance or just... Everybody needs good sleep.

**Robb:** To not die.

**Nicki:** To not die, to age well, all that good stuff. So again, that kicks off, kickoff call, this Friday, today, September 9th, and then the carb test, and then the 30-day reset begins on Monday, September 19th. And that is free to members of the Healthy Rebellion community, so if you want to participate, all you got to do is join. You can do that at

join.thehealthyrebellion.com. And gosh, I think that is all I really wanted to share upfront.

**Robb:** I'll just do my quick, greasy used car salesman pitch. What are we, 30 bucks a month? If you do the monthly thing, it's a huge value, even if you swoop in to just do the reset and get your little red wagon going in a better direction. I know of programs that are not remotely as good as what we offer, that are 10 times the amount, and don't have as cool people. It really is amazing, the transformations that occur in this thing, so if you're-

**Nicki:** And the support and just the comradery. And I don't know, I know I'm biased, but I feel like we have the best community. The people are solid, they're supportive, they're real, they're-

**Robb:** Tough and resilient.

**Nicki:** They're tough and resilient, yeah.

**Robb:** They're rebels.

**Nicki:** They are. So anyway, if you want to join, come join us.

**Robb:** So chatted with Chris. I generally don't do interviews, as many folks will know. Enjoy doing them, burned out on doing them, always enjoy chatting with Chris. There's a few people like Chris Kresser, Dave Duley, and some other folks, that if they've got something going on, I will break my self-imposed rule and-

**Nicki:** Against being the interviewer. You are often the interviewee.

**Robb:** Against being the interviewer, yeah. Chris is just a polymath on this stuff. I feel like I have a very good grasp of this material, but Chris is always... I pick my jaw up several times while chatting with him about anything. And we were talking about nutrient density, and I mean, I've been talking about nutrient density for a long time. Matt Lalonde, which we talked about a little bit in the interview with Chris, he really put the nutrient density concept on the map within the ancestral health space back in 2012.

**Robb:** And when you think about credible ways to parse out nutrition, I think the nutrient density story cuts the Gordian knot because whether you're in the calories in, calories out camp, or the it's all insulin, Gary Taubes kind of driven deal, what's really interesting is, when you look at the most nutrient-dense foods, and we pulled into some research that is new, relative to when Diana Rogers and I did Sacred Cow, which we built the whole thing around the sustainavore kind of model of eating, which is an eye towards both sustainability and nutrient density.

**Robb:** And the nutrient density update, I guess, that this researcher, Ty Beal, has really brought to the forefront is not just how much nutrients a food has, but actually, how much one absorbs. So spinach looks pretty good at face value, with regards to, say, calcium, but when you look at how little calcium one absorbs out of spinach, it is absolutely tiny, and that's assuming you have adequate stomach acid, and a functional gut, and on, and on and on. And some of this stuff that we talked about included this reality that, when we start becoming nutrient-insufficient, and it may be, at a subclinical level, that we don't have rickets or we don't have overtly-soft bones or what have you, but let's say you're deficient in vitamin D, but you consume adequate magnesium, you still won't absorb all of that magnesium, because you need the vitamin D to just get it out of your diet.

**Robb:** And even that said, something like 96% of Americans don't stick enough magnesium in their pie hole to start off with. And then, there's all these other things, like the average body weight of American men and women in the '90s, like '91, women was 135, men was 168. Today, women, average body weight is 169, men is just under 200 pounds, 197. There's all kinds of problems with that, but when we are told how much we need of these different nutrients, it's assuming that we're 30 to 40 pounds lighter than what we are now, and so there's all these layers of this nutrient-dense story, including... We dug into, what are the most nutrient-dense foods, how we might define nutrient density, how nutrient density has been discussed in the past, and the clinical manifestations of what inadequate nutrient intake looks like. And then, Chris has some pretty interesting solutions for how we get on top of this.

**Nicki:** Awesome. I can't wait to listen to that. You just recorded this with him, so your intro is captivating.

**Robb:** More on point than usual.

**Nicki:** Captivating, yes. Sounds good. Before we jump in, I just want to share our word from our sponsor, which as you all know, is our salty AF electrolyte company, LMNT, which sponsors the Healthy Rebellion Radio and all of our Salty Talk episodes. So I know, as listeners of this show, you know that your electrolyte status directly affects both your performance and your recovery, so if you're dragging during or after workouts, you might need some more electrolytes. If you're getting muscle cramps, same, same.

**Nicki:** And your electrolyte needs can increase depending on your level of exertion, the amount of work you're doing, and your environment, so grab some LMNT. Good news is, there's a flavor for every taste bud, citrus salt, raspberry, orange, watermelon, spicy flavors like mango chili and lemon habanero, even chocolate salt. For you folks that love a nice hot cup of something cozy in the evening or the morning, chocolate salt does the trick. Get yours at [drinklmnt.com/robb](http://drinklmnt.com/robb). That's [drinkL-M-N-T.com/R-O-B-B](http://drinkL-M-N-T.com/R-O-B-B). And we'll jump into this interview with Chris Kresser.

**Robb:** Hey, folks. Welcome back to another edition of the Healthy Rebellion Radio. I have my dear friend, Chris Kresser, here today. Chris is the smartest person in the room. Doesn't matter which room you are in, he's generally the smartest guy, unless Matt Lalonde is around, and then we'll have to-

**Chris:** Yeah, whatever happened-

**Robb:** ... defer to the Kraken.

**Chris:** ... to that guy?

**Robb:** He was so-

**Chris:** Is he still alive?

**Robb:** He's still alive. Matt did... Do you remember The Watchmen, the-

**Chris:** Yeah.

**Robb:** Yeah. He did a Dr. Manhattan. He realized he was so much smarter than everybody else, that he basically left the planet, went to another galaxy, and probably created life anew, so it could be done right the next time.

**Chris:** With the proper chemistry.

**Robb:** Exactly, yeah, yeah, and... yeah.

**Chris:** Yeah, I thought maybe that, or he uploaded his consciousness and is now controlling everything in the universe, or something like that. But-

**Robb:** I think if he did that, we would be in a much better state of affairs than what we are.

**Chris:** That's true, that's true. Yeah, good point, unless he just gave up on us and went somewhere else entirely.

**Robb:** That happened too. He did just wash his hands of all of us in disgust, but no, I-

**Chris:** Can't blame him, can't blame him.

**Robb:** What's funny though, is, so we're going to talk a lot about nutrient density, and Matt is really one of the first people in this ancestral health space that shined a really powerful light on nutrient density. And really, I would make the case that it was the most credible argument for "paleo", because what was interesting is, when you shuffled the various food groups through a nutrition analyzer and looked at the vitamins, minerals, essential nutrients relative to caloric intake...

**Robb:** And he did this project. It was crazy. He did thousands and thousands of lines of data entry into a spreadsheet, and then created this 3D graph of the relative nutrient values of all these different foods. And somebody looked at it, and this is a PhD thesis on this, and they're like, "How long did it take you?" He's like, "I didn't sleep for four days, just basically knocked it out." But this was early maybe 2012 that he did this.

**Chris:** Yes, you have an amazing memory. I have to say, I have the Lalonde Nutrient Density Scale in my first book. And I am actually looking at an article on my website where I have an article on nutrient density, and I have the Dr. Matt Lalonde Nutrient Density Scale that he presented at the Ancestral Health Symposium in 2012, so you nailed it.

**Robb:** Cool. Well, the reason why that stuck in my head is, he told me that bacon was disproportionately nutrient-dense relative to other meat sources. And I had to live with that information for a couple of days without sharing it with anybody, or he would've pinched my head off my shoulders, so it-

**Chris:** Give us all permission to eat lots of bacon, that's Matt Lalonde's legacy.

**Robb:** Yeah, yeah. So-

**Chris:** Well, yeah, and we'll talk about this too, but I'm sure you recall the number-one food on his scale and every other scale since then, organ meats.

**Robb:** Yeah. I mean, usually, it's organ meats and/or shellfish seem to be right, like Dueling Banjos back and forth. Do I have that wrong, or is that-

**Chris:** Organ meats are ahead of shellfish, but shellfish are always in the top five, for sure, and there's been a new... Do you know Ty Beal?

**Robb:** Yes, yep.

**Chris:** Yeah, so I don't know if you saw the study that he published with Flaminia Ortenzi back in March of this year. And it was a landmark paper because, unlike most nutrient density scales, even Lalonde's, which he acknowledged, one of the issues that he had in making that scale was that there was very little information on bioavailability of foods. And so, he acknowledged that, and there was nothing he could do about it because the dataset that he was working with didn't have any information about bioavailability.

**Chris:** So this new paper that Ty Beal and Flaminia Ortenzi published was the first look at nutrient density that actually considers bioavailability, which is critical, right? If you're looking at levels of calcium and foods on paper, spinach is going to come out looking really good, but then you find out that only 5% of calcium in spinach is absorbed, because spinach is also high in oxalic acid, it doesn't look so good anymore, right? But most of the studies on nutrient density don't consider bioavailability, so foods like spinach might end up looking pretty high on the list for calcium, even though you're not going to absorb very much calcium at all if you eat it.

**Chris:** And so, this new study was the first to consider bioavailability for the most common essential nutrients, and I'll just cut to the chase, five of the 10 top foods were organs, so it was liver, kidney, heart, pancreas, and spleen were in the top 10. And then, you had small, dried fish, shellfish, dark, leafy greens, and a couple others that I'm... They're mostly animal products, and then dark leafy greens. So that's what happens when you consider bioavailability. Those foods come out even higher than they were on the studies previously and the scales that people like Matt Lalonde made.

**Robb:** Oh, interesting. In Sacred Cow, we really built our whole case around the nutrient density story, but this material had not been published yet. Diana did the bulk of the work on this, and she, item by item, went through in a brute force effort, looked at the nutrient density, and then also, tried to correlate studies on bioavailability. I think we covered maybe 15 of the heavy hitters and did some compare and contrast around that, and it's a remarkable eye-opener when you look at stuff through that lens, because these things that look really good, like spinach, end up not really faring as well. And then, when you start thinking about some of the toxicity considerations, like somebody doing a kale smoothie and they end up with kidney damage from oxalate poisoning, like putting glass shards through their loops of Henle and whatnot, that paints a whole other interesting picture to this.

**Robb:** And Chris, I know you've been informing what you are up to on a clinical side for your whole career, both with a really, really great steeping in the current science, but then also, just empirically looking at what folks are doing and how they're faring. Nutrient density has been important for you for a very long time, I mean, since 2012, at least, when Matt Lalonde really, I think, rattled all of our cages on this, but what has been the shift, such that you're like, "No, man, this really is the 800-pound gorilla in the room and thing that we need to really be focusing on"?

**Chris:** Yeah, the shift was treating hundreds of patients over a 10-year period and having maybe five that were not nutrient deficient during that time, and I'm not exaggerating. I mean, that's probably accurate. And as you know, Robb, my patients are not people who are just walking down the street, and see the sign on the door, and wander in and see what's happening. These are people who are typically folks who've followed me for a long time, or they're really functional, medicine savvy, they've been doing an ancestral diet, nutrient-dense, whole foods diet, they're paying a lot of attention to what they eat. They are probably in the top 0.1% of the population in terms of their attention to diet, nutrition, and just health overall.

**Chris:** And what was surprising to me, frankly, and also discouraging, is just how common nutrient deficiency still was in that patient population, and I test every single patient that I saw for my nearly 15-year career. I tested for nutrient status, and I did it in several different ways, which... I mean, and this is one of the big bummers of nutrient testing, is there's no single test you can do to adequately assess all nutrients. You have to test the serum for some, you have to test plasma for others, you have to test hair to get long-term status, particularly of some minerals. You have to do a buccal cheek swab to test for intercellular levels of some nutrients like magnesium to get the most accurate view. You can have do urine, in some cases, or saliva. I mean, it's crazy how complicated it is.

**Chris:** And then, with some nutrients, like calcium, the level of calcium in the blood is so critical to our survival, and it's maintained in such a narrow range in the blood that you cannot assess calcium levels by measuring them in the blood, because if your calcium intake drops, your body will just pull out calcium from your bones in order to maintain that constant serum level, otherwise, you die. So the body is like, "Let's see, should we die or should we take calcium out of the bones? Let's take calcium out of the bones." So whenever you measure calcium in the serum, unless there's a very serious disease state that's present and that patient is in the hospital, it's going to be in that same range.

**Chris:** And so, in order to really get a sense of calcium intake, we have to resort to pretty low-tech methods, like measuring people, having people use Cronometer or some app like that to carefully track their food intake over a three-day period, and then just a set estimate based on that, what their calcium intake is. Obviously, that's not ideal, but it's the best we've got for calcium.

**Chris:** So anyhow, I have all these different ways that I screen patients for nutrient status, and during that entire period, it was extremely rare to find someone who had no deficiencies. Most people had at least one to four deficiencies, and I would say it was not uncommon for people to have five to 10 nutrients that they were falling short on. So that was the big red flag, alarm bell that went off for me, is over that period of time, just seeing how common that was, even in this highly-motivated, highly-educated group of people.

**Robb:** And I'm sure that this is going to vary enormously, but clinically, what were these folks experiencing? And I know it's probably going to depend, to some degree, on if they were deficient in iron, it's going to look different than magnesium, but I mean, do you have a couple of buckets that people were... What were people noticing life, vigor-wise, that was, in part, maybe getting them coming through the door? What were you seeing? What were they experiencing that was basically an outward manifestation of different nutrient deficiencies?

**Chris:** Yeah. Well, Mark Hyman, who we both know, our colleague in the functional medicine space, has a term that I think answers this question pretty well, which he calls FLC, feel like crap, so if we're going to put it under one umbrella, that would be it. And of course, this is one of the tricky things about nutrient deficiency, is a lot of the signs of nutrient deficiency are nonspecific, so fatigue, poor digestion, lackluster performance, slower recovery, sleep difficulties, depression, anxiety, skin issues, hair issues, cognitive problems, like brain fog, difficulty focusing or concentrating, poor memory, hormonal issues.

**Chris:** And the reason that the symptoms run the gamut like this is that nutrients are essentially the fuel that our body needs to function optimally. I mean, certainly, we have the macronutrients, like carbohydrates and fat, that provide the basic ingredients that we need for ATP production, but it's actually the micronutrients that determine how

efficiently we convert carbohydrates and fat into usable energy. And those micronutrients are co-factors for enzymes in the Krebs cycle, and both aerobic and anaerobic respiration, and then those micronutrients are also co-factors-

**Chris:** And then those micronutrients are also co-factors in enzymatic reactions that pretty much run the entire show in the body, from the endocrine system to the nervous system, to the brain, to our immune system and how we fight pathogens and balance our innate versus adaptive immune responses, every single process that happens in the body requires micronutrients, like vitamins, minerals, trace minerals, and other compounds.

**Chris:** This is why I think this is such an insidious issue. Because most people who are experiencing signs and symptoms of nutrient deficiency don't even know it. And their doctor doesn't even know it. Because they go to the doctor and they have these complaints which seem disparate and not related to one another, and so then the doctor might refer, "Oh, digestive issues, go see the gastroenterologist. Oh, you got hormone imbalance, go see the endocrinologist. Oh, okay, you're having immune issues, maybe you see the immunologist." The common theme that's tying all those things together is nutrient deficiency, but it's WNL, we're not looking. So the patient ends up going to those different specialists, they get prescribed a bunch of different drugs, but the core root cause of the problem is not being addressed so they just continue to struggle. And I've seen this so many times over the years.

**Robb:** Chris, it's interesting, I'm just noodling on some of the folks in the carnivore space. There's pretty good... I don't know about controversy, but there's this push-pull where you have some people like Dr. Baker, and then I'm even thinking about Charlene Anderson who has been eating basically ribeyes only for 20 years and seems to be crushing it. And then there are some folks that are very much in the eat a huge variety of organ meats every day. And that just meat only or animal product only thing is a whole other discussion. Which in some ways, when you look at this nutrient density characterization per Ty Beal's work, it maybe looks a little more credible because so many of the... Especially if you're sticking in some shellfish and different stuff like that. But what are your thoughts on some of these folks that have a shockingly limited diet?

**Robb:** And I know some people like Jordan Peterson, Mikhaila Peterson, they arrived at that spot because they have these intractable autoimmune diseases and depression and gut issues and everything, and I call them one-cut carnivore. They may only eat ribeye, and it's got to be grass-fed, it can't be aged, all these other things. What do you think is going on with those people relative to this broader nutrient density story? Are they getting enough legitimately out of one cut of meat, or were they just so broken from other things that this is a relative win, and they may end up experiencing some problems down the road? What are your thoughts on that?

**Chris:** Yeah, it's a really good question and I've thought a lot about it. And the truth is, I don't know for sure, and I don't know that anyone knows for sure. I can give you a few hunches and I can tell you what we do know from the research that we have, anthropological lands, etc. So my take on carnivore has always been what you just said, essentially. I think there's no doubt that it has miraculous impact on some people. I've had patients go from being at death's door to being fully functional after a couple months of the carnivore diet, usually people with very severe autoimmunity or other immunological issues where they're reacting to so many different foods. And then by dramatically simplifying a diet and limiting their food intake to meat, which is actually digested pretty high up in the gut, in the small intestine, my take on carnivore is it's essentially a way of getting the benefits of fasting, but for longer.

**Chris:** So there's a saying in medicine that "fasting cures all disease". And the problem with extended fasting is it also cures life.

**Robb:** Right?

**Chris:** If you are doing it for too long, you're not going to make it. But what if you could get a lot of the benefits of fasting? Which I think at least some of those come from giving the gut rest, reducing the amount of substrate that's getting to the gut, and just giving the digestive system a full rest. If you're eating animal products, those are absorbed pretty high up in the small intestine relative to plant foods which have indigestible fibers and things like that in them. And I think that that essentially allows people with these complex autoimmune conditions, which almost always involve intestinal permeability and a significant gut element, to heal in a way that they couldn't if they were continuing to eat plant foods with fibers and things like that.

**Chris:** So I think you take someone who is extremely ill and then you give them that advantage, then they're going to feel way better and function way better than they were before. The question is, what's the long-term effect of this? Some nutrient deficiencies take years or even decades to develop. We know this from the research. And some of the consequences of nutrient deficiency can take even decades to fully manifest.

**Chris:** Now, I should clarify terms here. If we're talking about what would be defined in the scientific literature as a true deficiency, those are fairly rare in the West at this point. I'm talking about a clinical deficiency that would lead to an acute disease like rickets or scurvy or beriberi or pellagra. In the West at least, those are now fairly rare, but what we're mostly talking about here is nutrient inadequacies. So what that means is, okay, you're not so low that you're going to die tomorrow or that you have a life threatening clinical acute condition, but you're well below the threshold that has been defined for optimal health and longevity.

**Chris:** And so in that case, you may not even notice significant symptoms early on. It might just be more not feeling great, low energy, poor sleep, kind of poor performance or recovery, that kind of thing. But then what happens 10, 15 years down the line, especially if you're low in nutrients that are helpful for fighting cancer and reducing the likelihood of cancer, or if you're low on nutrients that are important for reducing the risk of cardiovascular disease, or nutrients that are really critical for protecting the brain or reducing the risk of dementia or Alzheimer's or other cognitive conditions? The full effect of that might not really manifest until you're in your 40s or 50s or 60s. So that's one thing.

**Chris:** Another thing is I think there's a big variation from person to person, just like in any other area of health or wellness, right? And genes play a role, and epigenetics. So I'll give you a couple examples. We know, for example, that... And this comes up. This came up in my debate with Joel Kahn on Rogan's show and when I've had debates with vegan and vegetarian advocates. Some people are pretty good at converting betacarotene, which is the precursor form of Vitamin A, into retinol; other people, not so much. So same with Vitamin K into K2, same thing with alpha-linolenic acid into the EPA and DHA and the long chain forms of omega-3 fat. And that explains why some people on a vegetarian diet can actually do just fine for a while. Like Rich Roll, for example, he seems to be doing pretty well on a vegan diet, whereas other people fall apart after two months.

**Chris:** I think there's probably a similar phenomenon with carnivore, that for reasons that are both understood and not understood, some people are able to eat a limited diet and do

pretty well even for an extended period, whereas other people after even just a few months on carnivore, it's terrible for them. And I've certainly had those patients in my practice as well.

**Robb:** Yeah, I've seen both ends of the spectrum with that as well. And it's kind of one of these jaw dropping things, and it... I guess a bit chagrining in some ways because it's literally the thing that saves one person might be the complete and utter undoing of another person. You're kind of like, "What the hell is going on there?"

**Chris:** Yeah.

**Robb:** It's crazy.

**Chris:** It's the human condition. It's bad for books and one-size-fits-all approaches, but it's the reality of the human condition in my experience. It was super frustrating early on as a clinician because every time I got excited about a treatment or an intervention that had worked so well for certain patients, and then I get all excited about rolling it out to all my other patients, and then find out that it's exactly the opposite for other people. So I've really learned over time that there's no one-size-fits-all approach, and that's why I have a special kind of aversion to that. When I see ideas like carnivore or keto or whatever promoted that way, my first question for people who are making that argument is, have you ever worked with people outside of yourself? I'm glad it worked for you, but tell me about the hundreds of people that you've worked with and then tell me that it works for everybody, because it rarely does.

**Robb:** Yeah, absolutely. Just on the kind of mundane topic of carbohydrate intake, I saw so much success with diabetes-related issues, metabolic syndrome, PCOS, all this kind of insulin management stuff in getting people on the lower carb diet was magic. And we had tons of people in our gym that had metabolic syndrome. And then as I started expanding into an athlete population, lo and behold, really glycolytic-based workouts day after day with inadequate carbohydrate is a fantastic way of destroying people. You can take a full length pencil and grind it down to a nub in remarkably short order by doing that in this, yeah.

**Chris:** 100%. And there's also often a difference between how men and women respond to that. And the way I think about that is, what's going on in the background? And I know you think about it in a similar way, as what's going on in the background? If you're pretty well resourced, you're sleeping a lot, you've got not a lot of stress in your life, you might be able to handle that, right? But if you're just burning the candle at both ends and barely keeping your head above water and then on top of that you do low carb and five WODs a week, well, good luck.

**Robb:** Right, right, yeah. I just shudder thinking back to the people they've broken.

**Chris:** The battle of days.

**Robb:** Yeah, yeah, it's funny, but...

**Chris:** But let me go back to one thing here. So I just pulled up Ty Beal's paper because it really is fascinating. I want to linger on it a little bit, and it does relate to your question about carnivore and people who are... Especially people who are rolling in some organs and shellfish on top and it not just the ribeyes. So here are the top 10 foods. Liver is number one. Spleen, number two. Small dried fish, dark leafy green vegetables, bivalves, so shellfish, kidney, heart, crustacean, so shellfish, goat, beef, and eggs.

**Chris:** I don't know if that was 10, but that's where I'm stopping. But here it makes them even more interesting. So on this scale, a lower score was higher. Because what they were essentially looking at was how much of a food would you have to eat to get a certain level of essential nutrients.

**Robb:** Right.

**Chris:** And so the lower score means the less of that food you need to eat to meet that demand. So liver had a score of 11. Spleen was 62, so that's already five times less nutrient dense than liver. And then I'm just going to keep going down the list here. Shellfish were around 90. Dark leafy greens were 72. So if you just ate organ meats and shellfish and dark leafy greens, you'd be doing pretty well. You go down to beef, beef is 275.

**Robb:** Holy smokes, wow.

**Chris:** So we are talking about more than a 20-fold difference in nutrient levels between liver and beef. This is why I've been banging this drum for so long, but I still don't think people have an idea of just how crazy nutrient dense liver is relative even to muscle needs, like beef. So I'm going to keep going. So Vitamin A rich fruits and vegetables, that's like carrots, red peppers, that's 297. And keep in mind, these are essential nutrients only. So the vitamins and minerals that we must eat, we're not talking about phytonutrients or anything like that. So quinoa, which if you pulled some people out of Whole Foods, you went into Whole Foods and did a survey, what are the most nutrient dense foods? A lot of people would probably say quinoa, right? It might make their list. That's 789.

**Robb:** Wow.

**Chris:** Relative to liver at 11.

**Robb:** 11.

**Chris:** And then we've got chicken, which was the most popular meat all through our childhood, right, Robb, in the '80s and '90s, boneless, skinless chicken breast?

**Robb:** Right.

**Chris:** That's 1,103.

**Robb:** Holy smokes.

**Chris:** That's 100 times less nutrient dense than liver. And then of course you get into other whole grains are like 1,175. Whole grains in general as a category was 1,768, so 1,768. And then you've got refined grains that's just 4,000+, it's basically off the scale and chart, not even on there.

**Chris:** So I just wanted to share that because I think it adds a pretty vivid perspective of just how much of a difference there is in even some of the foods that are definitely nutrient dense, like beef, eggs. Some of these foods are... I'm not saying they're not nutrient dense, I'm just saying liver's that much better.

**Robb:** It's all relative, yeah, yeah. Wow.

**Chris:** Yeah. So I think that does lend some credence. I mean, both to paleo, especially if you're including organ meats and shellfish, but to why some people might do well on a carnivore diet, especially if they're including organ meats.

**Robb:** And I mean a lot of these folks... I mean, I don't want to get into this too far, but the Liver King guy, where he's eating raw liver and everything, which I'm like, "Dude, grill that with a little bit of bacon fat or something, buddy."

**Chris:** Parasites, anyone?

**Robb:** Yeah. Sheesh, yeah, yeah, yeah. Yeah, liver fluke would be a real bummer.

**Chris:** Yeah, it's not fun. I've seen it before.

**Robb:** You and I have traveled internationally to enough sketchy places that it's like, "Yeah, I'll bring mine to a medium-rare, thank you."

**Chris:** Yeah, schistosomiasis? No, thank you.

**Robb:** Yeah, yeah. Gosh, I'm thinking a bunch of different things. One of them is, what are your thoughts... And I guess maybe this is a little bit kind of male-specific, or men and maybe peri- or postmenopausal women, what about the iron overload potential of, say, liver? Because clearly liver is playing out really favorably here. What do you think about that instinct?

**Chris:** It's real. It's real. I mean, you know from our conversations, I have caught so many people with iron overload over the years that had no idea that they had it. And that's a scary one because iron basically causes our organs to rest. That's the easiest way to think about it. And it can do a lot of damage without us even really knowing about it. And most doctors are not doing full iron panels on patients. And so I would always do a full iron panel plus ferritin, soluble transferrin receptor, and other markers. And it was unusual for me to go more than a couple weeks or maybe a month without finding someone, either a menopausal woman or a man, that had iron overload. It might not have been full blown hemochromatosis, but the levels were elevated enough to be causing damage.

**Chris:** So I'm not a big fan of... And I'm glad we're having this conversation because someone might be listening to this podcast and heading out to the store already to stock up on liver and eat it every meal. Please don't do that. Because you really should think about it as a super food or almost kind of a medicinal food. And I would say for most people, probably a couple servings a week is all you need because it's so nutrient dense. You really don't need to eat more than one to two, three, to four ounce servings of liver a week to get the benefits. And once you go beyond that, you are pushing the envelope in terms of iron overload potential.

**Chris:** And most people, if they get more iron than they need from the diet, will just excrete what they don't need. But if you have genetic polymorphisms that lead to excess iron storage... Which by the way, is the most common genetic polymorphism of people of Northern European descent, it occurs in about one in every 200 people in North America and Northern Europe. So that's pretty common, right?

**Robb:** Mm-hmm.

**Chris:** In a country of 300 and, whatever, 10, 20 million people, that's a lot of people that have this tendency to store excess iron. And again, the problem is it's not so easy to know if you're in that group unless you have a functional medicine clinician that knows this stuff and knows how to test you genetically for that and is running full iron panels on you. So I think for most people, the safest approach is just maybe three to six ounces of liver a week, and not a bad idea to get a full iron panel once a year just to make sure you're on the right track.

**Robb:** Okay. We're probably right around there. Our Taco Tuesdays and occasionally when we do chili, we will mix, oh man, probably about a half a pound of liver with two to three pounds of either ground beef or ground bison, and mix that all up together and then season it. And I can't tell that there's any liver in it. I actually like liver, like liver and onions and stuff like that, but the kids are still kind of a tough sell.

**Chris:** Lucky you.

**Robb:** But we will usually get one of those meals per week, but yeah, yeah.

**Chris:** Yeah, I think that's about right for most people. And again, there's some individual variation, some people are going to be more sensitive to it, some people will be less sensitive to it, but that's a good kind of general rule.

**Robb:** Chris, what are some of the other biggies that are being missed? I'm assuming maybe selenium. And I was kind of wondering about that because Brazil nuts are touted as one of these big selenium sources, but I'm cringing here thinking that there's probably a bunch of phytates that lock all the selenium up and it's completely inaccessible. Do you have any sense of where selenium is in the story and what good... I think, also, shellfish are reasonably good sources of selenium, right?

**Chris:** Yeah, 16 of the top 25 sources of selenium are ocean fish and shellfish, so that's definitely the best source of selenium by far.

**Robb:** Okay, okay.

**Chris:** But I'll tell you, so the Linus Pauling Institute, which is now at Oregon State... Linus Pauling, two time Nobel laureate, very smart guy, was one of the first people in the modern era to shine the light on the importance of nutrients in our optimal function. And he was also one of the first people to expand the conversation around nutrients, beyond just looking at what level of deficiency will kill us. Let's actually look at what is the optimal level of nutrient that we need, and then what are people actually getting in food?

**Chris:** And so the Linus Pauling Institute has a good article on their site where they quantify nutrient inadequacies. We talked about how that's a better measure for most people because we're interested in optimal health and longevity, not just not dying from nutrient deficiency. So I'll give you some stats from there. 94% of people don't get enough Vitamin D, so that's not that surprise... Oh, I forgot about potassium. So 100% don't get enough potassium.

**Robb:** Oh wow, wow.

**Chris:** That's a pretty shocker, huh? I mean, in a way it is, in a way it isn't, but our potassium intake in ancestral cultures was sometimes as high as 10 milligrams a day or...

**Robb:** 10 grams.

**Chris:** 10 grams, excuse me. Now, it's below a gram for some people, so it's like dramatically less. And of course, sodium intake has gone up. And I'm not a sodium-phobe. I think a lot of people are unnecessarily scared of salt. And a lot of that early research on salt was...

**Chris:** ... Of salt. And a lot of that early research on salt was bogus, but the potassium sodium ratio is still important. And if you get way more sodium than potassium, that's not going to work out well. And that is true for a lot of people. Next is vitamin D. That's 94% don't get enough. 92% don't get enough choline. I think magnesium is probably in between 90 and 100%. Don't get enough. I'll come back to that because it's a special case. 89% don't get enough vitamin E. 67% don't get enough vitamin K. 52% don't get enough magnesium according to this. I think that's wrong. And I'm going to explain why in a second. Selenium, it's below that. It's one of the few nutrients that the majority of Americans are getting enough of according to the research.

**Chris:** But I think there's some nuance in all of these data. And this is a case where bioavailability plays a role. They're just assessing intake based on what's levels of these foods on paper without considering bioavailability. And in some cases, the RDA or the estimated average requirement hasn't been updated for many years. Let's use magnesium as a case study here and see why that's important. The amount of a nutrient that we need is based on several factors. Age is one. Kids need different amounts, of course, than adults. Pregnant women need different amounts than women who are not pregnant. The elderly often need different amounts. And so one factor is age. Another is health status or whether you're pregnant or not, or chronic disease, any other factors that might affect the demand or need for that particular nutrient.

**Chris:** But another big one is body weight. Makes sense. The higher your weight is, the more of a nutrient that you're going to need to support all of the metabolic processes. The RDA for magnesium was last published in 1997, and at that time the average body weight was 133 pounds for an adult woman and 166 pounds for an adult male. Well, in 2021 last year, a group of researchers were like, Wait a sec, weights are a lot higher now. Maybe we should go back and look at the RDA for magnesium and update it to reflect the increased average body weight in the US population. They did that and they recalculated the RDA according to the current average weights of male and female adults, which are, again, in 1997 it was 133 pounds for adult women. Today, it's 169 pounds average for an adult female. There's been a 30 plus pound increase in average body weight for adult women during that period. And for men, it was 166 pounds in 1997, and now the average weight is 196 pounds.

**Robb:** Crikey. Wow.

**Chris:** That's a whole nother conversation. The RDA back in 1997 for women was 320 milligrams. And for men it was 420. When they updated the RDA based on these new body weights for women, it went from 320 to as high as 530 milligrams per day. And for men it went from 420 to as high as 650. That's a massive increase in the amount of magnesium that we now understand is required for optimal health. And if we look at the average intake for US adults today is 340 milligrams for men and 255 milligrams for women. This means that the average American is now consuming between 200 and 300 milligrams per day less magnesium than they need according to these updated values. That's not just true for magnesium. That's true for a lot of other nutrients across the board, like selenium, et cetera.

**Robb:** And the crazy thing is it's such a self-reinforcing cycle. Hyper palatable, low nutrient dense foods allow us to really easily overeat. We get to a higher body weight. It arguably increases our micronutrient need, which then is under met and makes us feel bad and lethargic and low energy. And so then it just becomes this compounding that sucks you down. Yeah.

**Chris:** Hoop show.

**Robb:** Yeah.

**Chris:** But unfortunately, it gets worse because of nutrient synergy. Nutrients don't just exist in isolation in our bodies. All of the nutrients interact with one another in fairly complex relationships. And so let's just stick with magnesium. We know that magnesium requires vitamin D to be absorbed in the intestine. And I also just mentioned that 94% of Americans are deficient in vitamin D. Even if someone is consuming enough magnesium, which is probably-

**Robb:** Super unlikely.

**Chris:** Yeah. Only a few percent of people, if that. If 94% of Americans are deficient in vitamin D, then even if they're getting enough magnesium, they're still going to be biologically deficient in magnesium because the vitamin D deficiency concurrent is interfering with their magnesium absorption. That actually works the other way around too. Vitamin D is required for magnesium to be properly utilized in the body. And I can give you so many other examples. Copper, for example, is required to move iron inside of the cell. And so I used to see patients who had iron deficiency anemia and they'd been prescribed iron supplements by another doctor. And it not only didn't help, it made them worse.

**Chris:** And then I would test them and I would see that they were copper deficient, and then I didn't give them any iron. I would just give them copper and all of a sudden their anemia went away. I could just go down the line. There's so many examples of that. And so the challenge is that even if we're meeting our needs for one nutrient, if we're deficient in another nutrient, that's going to be problematic. And the guy who's done the most work on this, is this professor a UC Berkeley named Dr. Bruce Ames. Have you heard of him, Robb?

**Robb:** Yeah. Yeah. Rhonda Patrick got her PhD from him. He's the guy that developed the Ames Test. It's this magic thing in to toxicology. Yeah, he's an icon for sure.

**Chris:** He's the smartest guy in the room actually. As long as Lalande is off the planet somewhere-

**Robb:** Bruce can take that role.

**Chris:** Yeah. He's a biochemist and a professor of molecular biology, and one of his big contributions in the field was something called Triage Theory. He proposes that all proteins and enzymes in the body can be classified into two categories, survival proteins and longevity proteins. And survival proteins are the ones that we need for of course immediate short term survival. Whereas longevity proteins are the ones that contribute to longer term health and wellbeing. An example of this is that even within a single nutrient, that nutrient can contribute to both survival functions and longevity functions. Vitamin K dependent proteins could be categorized into the ones that are required for short term survival, which are primarily blood clotting functions, keeping us from dying if we get in a fight or lose blood or something like that. And then those that are involved

in long term health like vitamin K2's role in regulating calcium metabolism, for example, or it's antioxidant functions.

**Chris:** The Triage Theory holds that even a modest deficiency of a single nutrient will trigger a built in rationing mechanism that favors the proteins needed for immediate survival and reproduction, which are the survival proteins, and then sacrificing those that are needed to protect against future damage, which are the longevity proteins. And that's true because the survival and longevity proteins often compete for the same nutrients, the same vitamins, minerals, and other nutrients. And if there's a shortage of a particular nutrient, the body will always prioritize what's needed for short-term survival. That's ancestral health 101. That's a dramatic shift in how scientists are now thinking about the role of nutrients in human health because historically they were thought of as compounds that were just crucial for survival or protection against severe disease, but now we're beginning, through the Triage Theory and Bruce Ames' work, to realize the role that they play in optimal function, aging, and longevity.

**Chris:** And if that theory is true, I think it actually explains, could go back to your question about carnivore diet, it could explain why mild nutrient deficiencies that develop on a really limited diet aren't enough to cause overt clinical symptoms right away, but still could potentially contribute long term to the aging process and diseases of aging. That blew my mind. When I put that together with all of what I was seeing in the clinic with patients and all of the research I had done on nutrient status, it was like the scales falling from my eyes, so to speak.

**Robb:** It makes sense. I remember Lauren Cordine was working on this paper where he was trying to do a 3D graph of all the nutrients in different foods and the relative amounts and ratios, and he was on this tear. He never ended up publishing it. I don't know if the theory didn't pan out or may have been too late in the career cycle, but basically he was making the case that we don't see significant benefit with standard supplementation. There's been lots of studies looking at people taking a Centrum vitamin every day and it doesn't seem to do much of anything for people.

**Robb:** But his thought on that was that when we look at foods, these nutrients exist in certain amounts and certain ratios and from one food to another, there may be a little bit of difference, but when we take most supplemental forms, there are these orders of magnitude amounts, super physiological levels of B vitamins and happening in ratios that you would never see in a regular food in that there might actually be some detrimental effects there because we're not just overshooting, but we're overshooting in a way that is maybe plugging into this Triage Theory, maybe worsening certain situations. What are your thoughts around that? Because the research on just standard supplementation is not really that. One might think, well, if we're coming up nutrient deficient, I'll just grab a Centrum Silver or whatever and I'll be good, but it doesn't really seem like that's the case.

**Chris:** Yeah, that's a great point. And there are lots of reasons for that actually. Usually, it's too much of the wrong thing and not enough of the right thing. A multi will have 200 IU of vitamin D. That's not going to do anything for most people. Most people need to be taking two to 5,000 IU of vitamin D if they're mostly indoors and not converting a lot of sunlight to vitamin D. On the other hand, they might have a substantial dose of ferrous iron, which is not well absorbed and even can cause gastrointestinal side effects or contribute to issues if someone is susceptible to iron overload or they might have a higher dose of alpha-tocopherol, which is the more common form of vitamin E that's actually been shown to increase the risk of prostate cancer and heart disease, which is ironic because most people are taking it to prevent cancer and heart disease.

**Chris:** Or they might have folic acid, which is okay for some people, but in susceptible folks, they can't metabolize folic acid, which is a synthetic form and convert it into the more active forms of folates and they end up with unmetabolized folic acid in their blood. And that can cause a lot of problems. And so in a lot of cases it's the wrong dose, it's the wrong form of a nutrient or it's not enough attention to nutrient synergy and how those nutrients interact. Or frankly, in some cases, they're just products made with really cheap inferior ingredients and materials, lots of artificial ingredients that interfere with absorption or cause their own food dyes and things like that.

**Chris:** Or change the color of the pill. Just all kinds of random stuff. And when you put it all together, it's just probably worse than not taking it in most cases. And so this is why for so long I didn't recommend a multi, for example, is because I couldn't find that many products that I could get behind and I would rather people not take some of the stuff that was in those products than to take them. But we've come a long way since then and I think there are some really high quality, good products available on the market now.

**Robb:** Yeah, I know New Chapter does some interesting stuff with trying to hit physiological levels of at least the B vitamins and doing it. They've put some thought into the amounts and the ratios of these things, but still, it's so funny to me how complex this is that I can't believe that anybody has survived ever.

**Chris:** I know.

**Robb:** How did anybody make it?

**Chris:** It's depressing, really. Of course, our ancestors had it easy because they didn't have to worry as much. I'll just touch on this briefly, it's a whole nother conversation, but there are a lot of factors present today that our ancestors didn't have to contend with. We have declining soil quality, which is a huge impact on nutrient availability in food. I'll just go back to magnesium to use it since we are on that as an example. Between 1940 and 1991, the magnesium content in produce in the US decreased by 25%. And that decrease has continued since 1991. That's 32 years ago. It's probably more on the order of 40% by now. And in other parts of the world it was even greater and in other nutrients it's greater. In one study that I read, we have to eat eight oranges today to get the same level of nutrition that even our grandparents got from a single orange.

**Chris:** That's a major change just in the last 100 years. We're not talking about thousands of years here. We're talking about just in the last 100 years. And then you have growing toxic burdens, you have heavy metals and glyphosate and other chemicals that are ubiquitous now in our environment that interfere with nutrient absorption. It's a good news, bad news thing because our minerals like calcium actually bind to those toxins in an effort to protect us from absorbing them. But the downside of that is that we can't absorb that nutrient in a form that we can utilize. Then you have the shift from local agriculture to industrial agriculture. That's a huge one in the case of produce because we know as soon as you take a plant out of the ground, the nutrient levels start to drop.

**Chris:** If you have a carrot that shipped 3,500 miles across the country, which is typical, I think the average is about 2000 miles, and it's in a dark truck and then it goes to the grocery store and sits in the back in a dark storage area and then finally gets out and someone buys it a week later or even 10 days later, the amount of nutrients in that carrot is going to be a fraction of what it would be if you harvested it from your backyard or got it from a farmer's market. And that's how most people are buying produce these days. And then you have six in 10 Americans have a chronic disease and four in 10 have multiple

chronic diseases. Chronic disease has a double whammy effect on nutrient status. It increases the demand for nutrients and it decreases nutrient absorption.

**Chris:** An example would be obesity. People who are obese, they don't convert sunlight to vitamin D as efficiently as people who are lean. Someone who's obese might need to take 10,000 IU of vitamin D to maintain a normal blood level, whereas someone who's lean might be fine with 2000 IU. And then they also don't absorb it as well in the digestive tract due to a bunch of mechanisms that I won't go into. But that's just one example. There are many other examples of how chronic disease interferes with nutrient absorption and increases the demand for nutrients. Then you have medications that are extremely common. Metformin is a classic example, has a lot of benefits. It's actually a pretty good drug as drugs go, but it's notorious for interfering with the absorption of folate and B12. And it's very common for people to develop B12 or folate deficiency when they're taking metformin.

**Chris:** Same thing is true of ibuprofen. Many over the counter and prescription drugs that are extremely common now interfere with nutrient absorption. I could go on, but these are challenges that we faced that even our ancestors from 100 or 150 years ago didn't face. For me, it was really hard to be honest for a while to accept that we can't really meet our nutrient needs from food now because I'm a guy who, as you know, we both are, really, really believe in the importance of eating a nutrient dense whole foods diet. And of course I still do and that's the foundation, should always be the foundation, but it was a sad day for me when I realized that's no longer enough. And that's actually why I decided to formulate the Adopt Naturals line and launch that because it just became so clear to me through all of the things that we've been talking about in this show, that most people are not getting enough nutrients, most supplements are garbage. And this is one simple way that I knew that I could help people.

**Robb:** Man, it's not the same magnitude by any stretch, but it was interesting when I was just looking at sodium needs as it relates to particularly lower carb diets and realizing how off the mark that was for most people. And then started looking at athlete populations and whatnot, and it's like, Oh, okay, salting your food just isn't going to cut it. And so we initially started, Mean Element was born with a free downloadable PDF of how to make your own keto aid, we called it. This much sodium fluoride, potassium chloride, mag citrate, mix it together, put some Stevia in it and everything. And that was the genesis for this thing.

**Robb:** But it is interesting. Folks will oftentimes say whether it's vegan or paleo or carnivore or whatever, well if your diet can't sustain you, then there's something wrong with the diet. But I guess one of the rejoinders to that, which again, there's pain I think on both of our sides in recognizing this, sit down and pencil out to me how you make that work now, given soil deficiencies, drug interactions, toxicity interactions, expanded BMI, the status of chronic disease and just trying to reel people back from the edge. Okay, how do you do that? And if you don't address this, then you don't start unwinding metabolic syndrome and chronic disease and all these other problems.

**Chris:** Well, that's where it got to for me is, am I going to sit on my high horse and wish that things were different or am I going to do something about this? Because that's the thing is I just looked up, down, all around, tried to figure out a way that this was possible to do through food alone. And certainly, with a nutrient dense paleo type of diet, you're getting the closest that you can. I'm not saying that's not important anymore. Of course, it's vitally important, but it's not enough.

**Chris:** And if it's not enough for a nutrient dense paleo diet that incorporates all those foods that I mentioned that are on the top 10 nutrient density list, and it's certainly not enough for a plant based diet where quinoa and whole grains, which were in the thousands on the nutrient density score versus 11 for liver, that's certainly not going to be enough. This has just amplified the relevance of what we've been talking about for years, I think, in terms of which diet is the best approach if you're optimizing for nutrient density. I think the full realization for me is that because of all of these factors in the modern world that unfortunately most of us don't have control over...

**Chris:** ... modern world that unfortunately most of us don't have control over, and then unfortunately, again, are getting worse rather than better. It's no longer enough. So it's like, okay, well rather than just sit around and complain about this, I'm going to-

**Robb:** Might actually do something to fix it. Yeah, yeah.

**Chris:** ... try to give some people an easy turnkey kind of approach that they can follow, where they have confidence that they're meeting their daily nutrient needs and don't have to think about it and don't have to stay up for late at night researching on the internet, trying to keep it all straight and figure it out, because that's where we are right now.

**Chris:** There's so much conflicting information out there. I just wanted to give people a said it and forget it kind of approach. A daily stack of supplements that would meet the core needs, and then take one step beyond to give people a little bit of an unfair advantage to provide a buffer against all of the threats that we face in the modern world now.

**Robb:** Well, it's funny because I think both of us are somewhat similar in this way, in that to whatever degree we are competent at what we're doing, it's because our own health issues have maybe been some of the most challenging. And had I been able to fix all my stuff back in 1998 to 100% or 99% I might not have gone down this path, it's just been ... I was definitely better than when I had ulcerative colitis so bad that I was facing surgery and potential death. But I know what it's like to feel good and although I feel better, I know that there's still some upside on that.

**Robb:** And I've done, I think, a pretty thorough job of trying to incorporate nutrient-dense foods over the last 20, 23 years, mucking around in this stuff. And I haven't done that next layer of diligence of doing something like what you've put together to plug those gaps, and then be able to critically assess, "Well, okay, do I qualitatively feel better? Do these nagging blood sugar issues improve? Do some of the food reactivity things that I still have ..." Dairy just seems to cause this autoimmune reaction in me, is that because I'm still in my triage theory, I'm still allocating all the resources to here and now and not later and so I'm not healing. There's still some layer of gut issues that are still present. Clearly there is, but it's like, well, what else am I going to do to be able to address that? Because I've-

**Chris:** Not your first time around the block.

**Robb:** It's not my first time around the block. All I'm envisioning right now is a mouse in a maze, that you're telling yourself that there's a way out and it's like, "Dude, no, I have looked through every corner in this thing and there's no way out of this." Yeah.

**Chris:** Yeah. You and I share a lot in common in that regard and yeah, it's exactly why we're even here having this conversation. I don't know what I'd be doing if it ... Probably not this.

**Robb:** Probably not.

**Chris:** I mean, don't get me wrong, I love my work, but it's not a coincidence I ended up here.

**Robb:** Right.

**Chris:** It was through the school of hard knocks that we've both been through and yeah, a lot of this came out of my experience working with patients and seeing how much of a difference repleting their full nutrient status made in their life and in their health and wellbeing overall. It's what I call a ... If we can use the nerdy word pleiotropic here. For the listeners who are not familiar with that word, it's kind of the opposite of the typical conventional medicine approach, where you use one agent to have one effect. A pleiotropic tropic intervention is an intervention that has multiple benefits across multiple different body systems.

**Chris:** So exercise is a perfect example of a pleiotropic intervention. But optimizing nutrient status is also another example. What I found in my patients, and also, myself when I started to bring my attention to this and take the ... I was experimenting for years to try to find the best combination of nutrients, and just a couple months ago when we launched, it ended up being the formulations that I chose, but what I found was that there were positive side effects. It was the reversing the cascade. So instead of being in a downward spiral it was an upward spiral. And a whole bunch of things that didn't even seem necessarily related started to improve in my patients, and they just started to feel better across the board. They were more resilient, they had more energy, they were sleeping better, they were performing better.

**Chris:** One example, one of my employees, my marketing manager actually, he just PR'd his half marathon time by five minutes, which might not seem all that impressive until that he just had a baby two months ago. So he was totally sleep deprived and dealing with being a new dad, and still improved his half-marathon time by five minutes and he'd been taking the stack for four months. I hesitate to even bring this up, that you know Elanne, my wife, Robb, how gluten intolerant she is. We were out at a restaurant in North Carolina, we were visiting some friends, and we went and had sushi. And unbeknownst to her, they put this sort of, I don't know, it was some kind of crispy thing on top of it.

**Robb:** Oh yeah. Yep.

**Chris:** You know what I'm talking about.

**Robb:** Yeah.

**Chris:** And it had gluten in it, and she ate it before she realized that it was on there. And historically that's a red alert type of situation. And in this case she was fine. I just want to be 100% crystal clear. I'm not saying these supplements cure gluten intolerance, but the reason I mention it is because it points ... You were just talking about, what if some of the problems that we've come to accept as normal are actually related to nutrient deficiency.

**Robb:** I mean, I've seen this in other people who just weren't as sick as I was, where they would do the diligence and 90% do this more nutrient-dense diet, get some sleep, hygiene buttoned up and some other things. And they're like, "Yeah, I'm generally gluten free, but if I get a dose here and there, it's not a big deal. I don't pressure test it really hard, but it's not a big deal."

**Robb:** Whereas for me, going out to eat, it's like, do you cook the hamburger in a separate pan, and was it anointed by the Dalai Lama and all this stuff because it'll absolutely smash me. But I've seen this in other people. It just seems like, to some degree, the further down the rung you are probably the more important this becomes, and/or the quicker you want things to resolve, the more important this becomes.

**Chris:** Yeah, exactly. And I think that's true. And then the flip side of that is also, for me, I'm doing pretty well right now actually. I'm approaching 50 and I feel really productive. My energy level's great. I feel as fit as I've been in a long time, and I attribute a lot of that actually to optimizing my nutrient status.

**Chris:** And I'm excited about what the next 50 years of my life is going to look like because I feel like I've discovered a hidden key to just giving my body the nutrients that it needs to thrive, and also building in that extra layer of resilience. So for when things don't go well or there's a global pandemic or whatever the case may be, that I've got that extra buffer, because I'm not just running on fumes and right at the bottom level of my nutrient needs.

**Robb:** Right.

**Chris:** I think of it as both, yes, it can have a therapeutic effect and help with when there are health issues present, but it can also, I think, help prevent those issues from occurring in the first place.

**Robb:** Keep recurring. Yep, yep.

**Chris:** Yeah.

**Robb:** Totally makes sense. Chris, it's exciting stuff. I mean it's pretty heavy stuff, but it's really cool. And it's interesting to me that I see all of this stuff go in cycles, it's kind of funny. We had paleo, and my version of paleo was always on the lower carb side of things just because that was what worked well for me, and for so many people I found that some carbohydrate restriction was helpful for appetite control and everything. But then I guess paleo gave way to a keto resurgence, and then this carnivore thing. And then in carnivore land some folks started saying, "Hey, why don't you eat some fruit and some nutrient-dense stuff to supplement this carnivore thing." And so it was meat-centric or whatever they called it, which looks super paleo to me, but it's like whatever.

**Robb:** But what's interesting is, again, maybe circling back to Mat Lalonde, and I think out of all the cases that are made around the ancestral diet and whatnot, the Maasai are tall and they have good teeth. And this infant mortality and all these kind of pretty debatable things, I think actually if you step back and have an open mind, they're actually compelling and they're informative in a lot of ways. But this nutrient density piece is one of the only things that I've seen, say, some hard line nutritionists that were really anti ... Let's say they were much more leaning towards plant-based and food pyramid and whatnot, and this idea of nutrient density is right in their wheelhouse, but these folks have never really looked at it with a critical eye.

**Robb:** And this is, I think, arguably maybe the totality of nutritional science. I mean, you talk about immunogenic foods as a sideline, and even that immunogenic food thing, how many of the immunogenic food problems where people react to things is just an outgrowth of being nutrient deficient, and not having proper gut function, integrity, proper immune response. I mean, there's so many ... Being able to feed the gut

microbiome, so that their genetics are added to our genetics to be able to degrade things like gluten and stuff like that. There's a lot of stuff going on there.

**Robb:** And really, at the end of the day, that nutrient density piece is probably the most credible part of this whole story from, both an ancestral health perspective, but it's certainly from a more mainstream nutrition perspective. How else do you assess the efficacy of nutrients if it's not, how much good stuff there is and how much of it you actually absorb per calorie?

**Chris:** Absolutely.

**Robb:** That seems tough to argue with. Yeah,

**Chris:** I'm so glad you said that. I mean that's exactly the realization that I came to. And it's not controversial. Like you said, no matter what lens you're looking through, with functional medicine, ancestral health, conventional medicine, conventional dietetics, everybody agrees on the importance of these nutrients and on basic concepts like bioavailability.

**Chris:** Now it's true that some of the research has lagged and we didn't have a lot of studies that actually were able to quantify bioavailability until recently. And it's also true that, as you pointed out, that some conventional dieticians haven't really done a deep dive and actually looked at nutrient density scales. And then the other problem, and Mat Lalonde talked about this way back in 2012, is that some of the earlier nutrient density scales actually penalized foods for having cholesterol and saturated fat in them.

**Robb:** Right, right.

**Chris:** So if you had a really nutrient-dense food like liver, because it had cholesterol, they would ding it. And then it would actually end up being much lower on the list, which was a totally artificial thing to do. It had nothing to do with the levels of nutrients that you were absorbing from that food. The cholesterol is completely beside the point, but they did that because that was the dominant paradigm at that time.

**Chris:** And so there's a whole bunch of reasons that this is only now coming to the forefront. But this is again, why, if I have one thing to contribute here as a legacy maybe this is it, because this is one thing we can all agree on that is essential. It's one thing we can all agree that is where we're falling short, and we've got decades of research showing what the consequences of that are.

**Chris:** And the good news of all of this, Robb, is that it's actually not that hard to fix. It's relatively low hanging fruit. If I was to dedicate myself to just autoimmune disease, that's a whole nother thing, there's a lot that goes into that. But this is a low hanging fruit problem with major consequences, that is relatively solvable and addressable for not a lot of money. Yeah, that's how I got to this point in time.

**Robb:** That's awesome. That's awesome. Chris, where can people track down more information about what you've going on here?

**Chris:** Yeah. The supplements are at [adaptnaturals.com](http://adaptnaturals.com), and the daily stack I've been talking about is the Core Plus Bundle. And so that's five supplements that address our nutrient needs and are just meant to be taken on an ongoing basis, just to give us that insurance policy.

**Chris:** But I really, really do think, believe that those ... You can't supplement yourself out of a bad diet, and there's a reason they're called supplements. I really do not recommend just taking these on top of a bad diet. And so we built an app called the Core Reset app, which has a 28-day diet and lifestyle reset with recipes, meal plans, shopping lists, guided meditation and mindfulness practices, guided at-home body weight movement routines. Because I wanted to just make it easy for people to dial that stuff in too, because that's critical. Please don't even take the supplements if you're not doing some of that stuff.

**Chris:** And so the app is free actually if you buy the Core Plus bundle, because we were really serious about helping people to get all that stuff dialed in as well. So that's [adaptnaturals.com](http://adaptnaturals.com), and then my website with articles, podcasts, all that jazz, is [chriskresser.com](http://chriskresser.com).

**Robb:** Awesome. Chris, can we maybe circle back in three, four months and have you back on and do another dive on this, and maybe do a little bit more discussion on the testing side of all this? Because I know we touched on it a bit, but nothing beats some quantification, and maybe we could circle back around on this in a couple of months and do another pass through all this.

**Robb:** But I think arming folks with some options around self-monitoring, both looking at some subjective things of just energy level and brain fog and sleep, and maybe plugging in some HRV status. It'd be interesting if we had some ways that folks can look at where they are today, incorporate this program, and then see what type of delta that they're getting out of that would be really interesting.

**Chris:** Yeah, yeah. Super excited about that. We actually, for everyone who buys the bundle, we send out a link to the MSQ, which is the multisystem questionnaire that I use in my practice as a survey.

**Robb:** I have used that several times as you've helped me with things. Yeah.

**Chris:** Yeah. And it's not mandatory of course, but we ask them to fill it out prior to starting to take the bundle. And then we ask people to ... We send an email out once a month to remind people to take it. So we're already collecting data, which is super exciting. I hope to publish that at some point.

**Chris:** And it's really interesting just to see the reviews coming in and see how many people are experiencing the same exact things that I experienced as I was putting this bundle together, and some of the case studies I shared of my employee and stuff. It's cool to see that quantification already starting to happen, and hopefully in a few months we'll have some data from the MSQs that we can chart out and share.

**Robb:** Well, as much as the interwebs have ruined our lives in some ways, there are still some upsides to being digitally connected.

**Chris:** Absolutely. Yeah. Yeah, thanks for having me on, Robb. It's been super fun conversation as usual. I'm going to be happy to come back in a few months.

**Robb:** Great to reconnect, and I look forward to that. I have generally sworn off doing any type of interview, but whenever Chris Kresser comes knocking then I make an exception for that. I would even do it for Matt Lalonde if he were to pop his head up again. Not too many people.

**Chris:** If he comes back into our universe.

**Robb:** Well, Chris, take care, man. It was great connecting with you and we'll talk to you soon.

**Chris:** You too, Robb. Thanks, again.

**Robb:** Okay, bye-bye.

**Nicki:** All right, Robb, any parting thoughts to share with our listeners today?

**Robb:** No, it's a lot of thoughts. We talked a little bit about Bruce Ames and triage theory, the work from Ty Beal, kind of updating nutrient density. And I guess, if anything, what this did is gave me a better appreciation of the possibility that some of the problems I've still been dealing with these 23 years down range, my health is definitely way better than it was before I figured out the gluten issues and some of these other food intolerance issues and whatnot. But I'm curious to know if some of the problems that I have still are low grade nutrient deficiency issues.

**Robb:** And so I'm going to be giving Chris's program a shot, which includes this interesting ability to ... Basically, he's opened up his client portal for the people who enter this Adapt Naturals program, so that you can document what your current health status is, tinker with this supplementation regimen, and then give it a pretty objective view at the end. So I'm going to be doing that, and fingers crossed that maybe some of my gluten intolerance and some of the other things that I have going on, improve.

**Nicki:** Awesome. Awesome. Well, folks, I hope you have a wonderful weekend. Remember to join us in The Healthy Rebellion, if you are so inclined, and partake in this next 30 day Rebel Reset. And remember to check out our show sponsor, Element. You can grab your electrolytes at [drinkmnt.com/robb](http://drinkmnt.com/robb). That's [drinkmnt.com/R-O-B-B](http://drinkmnt.com/R-O-B-B). How many ways can you mix and match that?

**Robb:** You had a good cadence going there.

**Nicki:** I did.

**Robb:** It sounded almost like a song. Okay, everybody, take care.

**Nicki:** All right, bye.